



S/N 09/259,762

PATENT

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Zhiping Yin et al.

Examiner: Jose Diaz

Serial No.: 09/259,762

Group Art Unit: 2815

Filed: March 1, 1999

Docket: 303.531USITC

Title: OXYGEN PLASMA TREATMENT FOR NITRIDE SURFACE TO REDUCE PHOTO FOOTING

**RESPONSE UNDER 37 CFR § 1.111**Commissioner for Patents  
Washington, D.C. 20231RECEIVED  
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Response  
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**REMARKS**

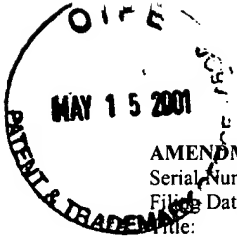
Applicant has carefully reviewed and considered the Office Action mailed on February 14, 2001, and the references cited therewith. Claims 1-3 and 5-11 are pending in this application.

**§103 Rejection of the Claims**

Claims 1-3 and 5-11 were rejected under 35 USC § 103(a) as being unpatentable over Lin et al (U.S. 6,143,666) in view of Puntambekar et al (U.S. 5,714,037). As the Examiner acknowledges, the Lin patent describes and claims treating silicon oxide films with an oxygen plasma, not silicon nitride films. Silicon nitride films are claimed in the present invention. The first preferred embodiment in the Lin patent describes treating a silicon oxide with an oxygen plasma. The second preferred embodiment in the Lin patent describes using TEOS as the silicon source material. The top of column 12 of the Lin patent describes a use of PVD sputtering methods to describe formation of pre-metal dielectric layers that include silicon nitride and silicon oxynitride. These dielectric layers are not described as being treated in accordance with the claims of the present invention. Thus, if anything, the Lin reference teaches away from the claims of the present invention.

The Puntambekar et al. reference describes an oxygen plasma flowrate of 0.15 to 15 sccm, in column 5, the bottom paragraph, which is much lower than the flowrate of at least 300 sccm oxygen plasma that is claimed. The Puntambekar et al. reference does discuss greater rates of nitrogen but not oxygen plasma. The Applicant asserts that there is no motivation in the Puntambekar et al. reference for one to increase oxygen plasma rate to what is claimed. To the contrary, one would be motivated to use a much lower oxygen flowrate.

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AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111

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**CONCLUSION**

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 373-6976 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

ZHIPING YIN ET AL.

By their Representatives,

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Date 11 May 2001 By Janal M. Kalis  
Janal M. Kalis  
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231, on this 11 day of May, 2001.

Name

Tina Pugh

Signature

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